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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/537,497

06/03/2005

Hachiro Nakanishi

TAN-352

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09/04/2008

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EXAMINER

OCHYLSKI, RYAN M

ART UNIT

PAPER NUMBER

4151

MAIL DATE

DELIVERY MODE

09/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/537,497	<b>Applicant(s)</b> NAKANISHI ET AL.	
	<b>Examiner</b> RYAN OCHYLSKI	<b>Art Unit</b> 4151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 03 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 2, 4, 6, and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04 December 2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The abstract of the disclosure is objected to because the abstract contains more than 150 words. Correction is required. See MPEP § 608.01(b).
2. The disclosure is objected to because of the following informalities:
3. Pages 3-4: The "Summary of the Invention" section does not provide sufficient antecedent basis of the role of the "good solvent" in the method. The term "good solvent" appears for the first time on Page 4 Lines 4-5 without specific reference to the fact that the "good solvent" is what the polyamide acid and alkali metal salt are initially dissolved into, before being added to the "poor solvent."
4. The use of the trademark ACRYDIC has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

5. Page 6 Line 14: It is unclear what is meant by "constitution."
6. Appropriate correction is required.

### ***Claim Objections***

7. Claims 2, 4, 6, and 7 are objected to because of the following informalities: The claims contain unnecessary repetitive language that repeat parts of Claim 1 with no further modification made in these dependent claims. In all these claims, all material

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starting from "after" in Line 1, continuing through "maintained" in Line 5 should be removed. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1, 2, 4, 6, and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

11. Claim 1 language regarding chemical concentrations in Lines 2-5 is not sufficiently clear. For the purposes of examination, it is assumed that the intended meaning of Lines 2-5 is that a polyamide acid polymer solution contains "0.5 to 80 weight % of alkali metal salt" and that this polymer solution is added to a poor solvent to make an intermediate mixture with "0.1 to 15 weight% concentration" of the polymer solution in the poor solvent.

12. Claim 2 recites the limitation "good solvent" in Line 6. There is insufficient antecedent basis for this limitation in the claim.

13. Claim 4 recites the limitation "good solvent" in Line 6. There is insufficient antecedent basis for this limitation in the claim.

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14. Claim 6 recites the limitation "good solvent" in Line 6. There is insufficient antecedent basis for this limitation in the claim.

15. Claim 7 recites the limitation "good solvent" in Line 6. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

19. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. ("Preparation of poly(amic acid) nanoparticles using the reprecipitation method and their imidization" Kobunshi Ronbunshu (2002), 59(10), 637-641) in view of Mitsui et al. (Japan Chemical Society 82<sup>nd</sup> autumn forum (2002), Abstract 2B7-10, already of record).

20. Regarding Claim 1, Suzuki et al. teach a method for preparation of porous polyimide microparticles comprising forming polyamide acid microparticles by pouring polymer solution with a concentration of 0.1 to 15 weight% polyamide acid concentration (Page 5 Line 21) into a poor solvent selected from a Markush grouping including alicyclic solvents ("cyclohexane" Page 6 Lines 1-2) and the temperature is met via falling within the range from -20°C to 60°C (Page 6 Line 6), wherein the particle size of said polyamide acid microparticles is adjusted to 50 nm to 10000 nm (Page 9 Lines 8-9) by controlling the temperature of said poor solvent (Page 12 Lines 5-8), then treating said polyamide acid microparticles by chemical imidation or thermal imidation (Page 6 Line 9 - Page 7 Line 1) so that the particle size distribution is maintained upon conversion to porous polyimide microparticles (Page 13 Line 20 - Page 14 Line 8).

However, Suzuki et al. do not teach polyamide acid containing 0.5 to 80 weight% of alkali metal salt, that pore size of polyamide acid is adjusted to 20 nm to 500 nm and porosity of polyamide acid is adjusted in the range from 0.1% to 30% by controlling a content or a kind of alkali metal salt, and that pore size and porosity of polyamide acid are maintained upon conversion to porous polyimide microparticles.

In analogous art pertaining to the preparation of porous polyimide microparticles from polyamide acid microparticle precursors, Mitsui et al. teach polyamide acid containing 0.5 to 80 weight% of alkali metal salt (Figure 1), that pore size of polyamide acid is adjusted to 20 nm to 500 nm (Figure 1) and porosity of polyamide acid is adjusted in the range from 0.1% to 30% by controlling a content or a kind of alkali metal salt (Page 1 Line 18 - Page 2 Line 5), and that pore size and porosity of polyamide acid are maintained upon conversion to porous polyimide microparticles for the benefit of more direct and reliable control over properties of polyimide microparticles to be subsequently used in applications such as filler for molding. Although Mitsui et al. do not specifically recite that the pore size and porosity of polyamide acid are maintained upon conversion to porous polyimide microparticles, a skilled artisan would understand that this is not an unexpected result, especially in view of Suzuki et al.'s disclosure that the particle size distribution of polyamide acid microparticles is maintained upon conversion to porous polyimide microparticles (Page 13 Line 20 - Page 14 Line 8). Additionally, although Mitsui et al. do not specifically recite that the porosity of polyamide acid is adjusted in the range from 0.1% to 30% by controlling a content or a kind of alkali metal salt, this is a result that would be obtainable by routine experimentation, especially in

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light of Mitsui et al.'s disclosure that porosity is controlled by controlling a content of alkali metal salt (Page 2 Lines 4-5 and Figure 1).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to combine Suzuki et al. with Mitsui et al. for the benefit of more direct and reliable control over properties of polyimide microparticles to be subsequently used in applications such as filler for molding thus resulting in a more efficient and optimal means for producing the porous polyimide microparticles.

21. Regarding Claim 2, Suzuki et al. further teach a organic solvent used as a good solvent selected from a Markush grouping including N-methylpyrrolidinone (Page 5 Lines 5-9) and a poor solvent selected from a Markush grouping including cyclohexane (Page 6 Lines 1-2).

22. Regarding Claims 3-4, Suzuki et al. further teach chemical imidation comprising the addition of acetic acid anhydride/pyridine to polyamide acid microparticles by stirring (Page 6 Line 16 - Page 7 Line 1).

23. Regarding Claims 5-7. Suzuki et al. further teach that the weight-average molecular weight of polyamide acid is in the range from 8000 to 220,000 (Page 5 Lines 9-11).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN OCHYLSKI whose telephone number is (571)270-7009. The examiner can normally be reached on Monday through Thursday from 7:30-5:00 and every other Friday from 7:30-4:00.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on 571-272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rmo

***/Angela Ortiz/  
Supervisory Patent Examiner, Art Unit 4151***